



### Course Objectives

1. Define heat.
2. Explain the three types of heat transfer.
3. Identify common units of heat.
4. Define temperature.
5. Identify common units of temperature.
6. Distinguish between sensible heat and latent heat.



### Key Terms (Define the following)

heat - \_\_\_\_\_  
\_\_\_\_\_

conduction - \_\_\_\_\_  
\_\_\_\_\_

convection - \_\_\_\_\_  
\_\_\_\_\_

radiation - \_\_\_\_\_  
\_\_\_\_\_

temperature - \_\_\_\_\_  
\_\_\_\_\_

sensible heat - \_\_\_\_\_  
\_\_\_\_\_

latent heat - \_\_\_\_\_  
\_\_\_\_\_

enthalpy - \_\_\_\_\_  
\_\_\_\_\_



## Principles

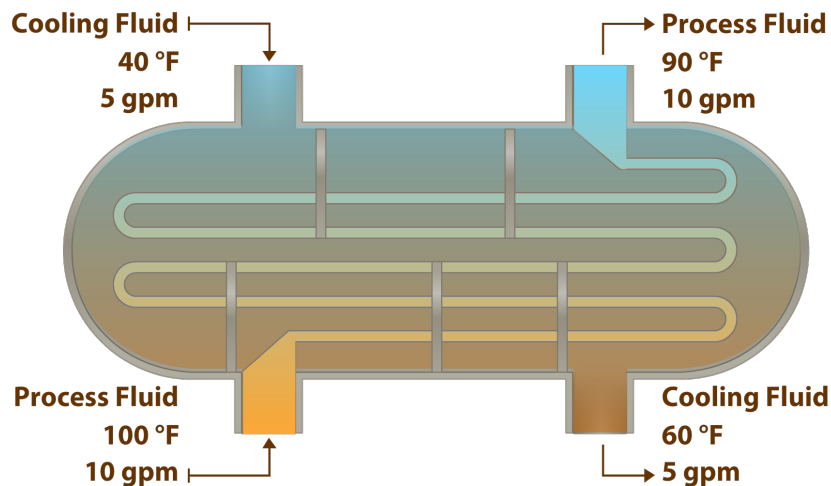
### Heat Transfer

**Change of Heat** = change of temperature **x** mass **x** specific heat

$$\Delta q = \Delta t \times m \times C_p$$

Suppose warm water enters the exchanger at 100 degrees Fahrenheit at 10 gallons per minute and comes out at 90 degrees Fahrenheit. Cool water enters the exchanger at 5 gallons per minute at 40 degrees Fahrenheit. What should the temperature of the cool water be when it leaves the exchanger?

(Since both fluids are water, we don't need to include the specific heat.)



$$\Delta \text{Energy Fluid 1} = \Delta \text{Energy Fluid 2}$$

$$10 \text{ gpm} \times (100 \text{ °F} - 90 \text{ °F}) = 5 \text{ gpm} \times (Y - 40 \text{ °F})$$

$$100 = 5Y - 200$$

$$300 = 5Y$$

$$Y = 60 \text{ °F}$$



## Questions

1. List 3 ways heat can be transferred.

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